REMARKS

Favorable reconsideration of this application is respectfully requested.

Claims 9-11, 14-46, and 48-53 are pending in this application. Claims 1-8, 12, 13, 16-23, and 47 have all been canceled without prejudice or disclaimer. Claims 9, 25-33, 36, 41, and 46 have been amended to even better clarify without the introduction of any new matter.

The outstanding Official Action presents a requirement to cancel non-elected Claims 16-23 or take other appropriate action, an objection to the drawings, a requirement for a new title, a rejection of Claims 9-11, 14, 15, 24-46, and 48-53 under 35 U.S.C. § 103(a) as being unpatentable over Rogers et al, (U.S. patent No. 4,571,819, Rogers) in view of Lee et al (U.S. Patent No. 4,952,524, Lee).

Turning first to the requirement to cancel non-elected Claims 16-23 or take other appropriate action, the cancellation of Claims 16-23 are believed to render this requirement moot.

With regard to the drawing objection, FIG. 3A has been amended to show dotted lines 8 in one of the grooves 6 as the thin thermal oxidation film noted at page 19, lines 25-26 of the specification. This part of the specification has been further amended to indicate correspond to these additions to FIG. 3A. Accordingly, the drawing objection is also believed to be moot.

Similarly, the objection to the title is also believed to be moot in view of the present amendment thereto limiting it to a method of manufacturing a shallow trench isolation structure.

It is believed that these amendments should be entered as responding to requirements newly raised in the outstanding Action.

With regard to the amendments to independent Claims 9, 25-29 and 36, it is noted that the amendment simply highlights the miss-characterization of the Rogers use of doped silicon oxide that has a melting temperature lowering dopant to lower the melting temperature of the doped silicon oxide to perform reflow for planarization as "annealing the oxide films (19) ... so that dislocation density generated in the corresponding device region in a vicinity of the grooves is minimized" as noted art the bottom of page 3 of the outstanding Action. See Rogers at Col. 6, lines 18-22 that clearly disclose the doped glass is melted and reflowed by the application of a temperature from about 950 degrees to 1150 degrees C. Furthermore, Col. 6, lines 26-29 state that this reflow process collapses voids 21-21 while reflowing the upper surface 26 of the glass to a substantially level topography. Clearly, the entry of the present amendments should be permitted as no new search or examination is required relative thereto.

Turning to the rejection of Claims 9-11, 14, 15, 24-46, and 48-53 under 35 U.S.C. § 103(a) as being unpatentable over Rogers in view of Lee, it is noted that the error in the outstanding Action of assuming that the Rogers use of doped silicon oxide that has a melting temperature lowering dopant to lower the melting temperature of the doped silicon oxide to perform reflow for planarization as "annealing the oxide films (19) ... so that dislocation density generated in the corresponding device region in a vicinity of the grooves is minimized" is for "annealing" has led to the further error at the top of page 4 of suggesting that the only difference between the subject matter of Claims 9-11, 14, 15, 24-46, and 48-53

is the use of an inert organic silicon source and ignoring that the Rogers process demands dopant be present for the required melting temperature reduction. Further note col. 5, lines 55-62 of Rogers disclosing that the silicon dioxide layer 19 is to be formed to a thickness of 2.5 microns with 3-9 weight % impurities such as phosphorus or boron, for example. This need for dopants in the silicon oxide could not be clearer nor could the need for the SiN layer to block diffusion of the dopant into the underlying structure be any less clear. See col. 3, lines 35-37 and lines 49-52.

Turning now to Lee there is no disclosure or suggestion of claimed method to be performed without using reflow with doped melt temperature lowering silicon oxide for planarization. Col. 4, lines 51-57 of Lee state that layer 23 is formed from precursors, together with dopants provided that the doping level in the layer 23 is lower than that in the layer 25 so that the layer 25 will have a lower flow temperature than layer 23. And, col. 4, lines 58-60 of Lee state that the flow properties of dielectrics deposited from BPTEOS are substantially influenced by te percentages of included boron and phosphorous. Further, Claims 1 and 13 of Lee include the step of depositing a filler material upon a thermal stress relief layer, the filler material having a flow temperature which is lower than the flow temperature of said thermal stress relief layer, while Claim 5 states that the filler material contains dopants to promote flow and Claim 7 calls for boron and phosphorous. Furthermore, Claim 13 includes the step of heating the flowable filler material to cause the filler material to flow.

Further, Lee fails to show claimed step of depositing oxide films in the grooves by a CVD method using an electrically inert organic silicon source, which does not contain such

melting-temperature-lowering dopants. Col. 4, lines 31-38 teaches the decomposition of TEOS in the presence of phosphorous and boron dopants in a reactor.

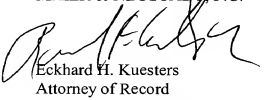
Further, Lee is silent about claimed step of changing the ring structure of the oxide films by annealing the semiconductor substrate so as not to melt the oxide films. Col. 5, lines 7-16 state that after filler material 25 has been deposited, it is flowed by heating it, either in a furnace or by a rapid thermal anneal (RTA) process.

Accordingly, Lee does not cure the deficiencies in Rogers, because both references fail to show the claimed method, which does not using reflow with the doped silicon oxide for planarization that both Lee and Rogers seek.

As no further issues are believed to remain outstanding in this application, it is believed that this application is clearly in a condition for formal allowance and an early and favorable action to this effect is, therefore, respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Eckhard H. Kuesters
Attorney of Record
Registration No. 28,870
Raymond F. Cardillo, Jr.
Registration No. 40,440

22850

(703) 413-3000
Fax #: (703) 413-2220
GJM:RFC/smi

I:\atty\rfc\00397292-am4.wpd